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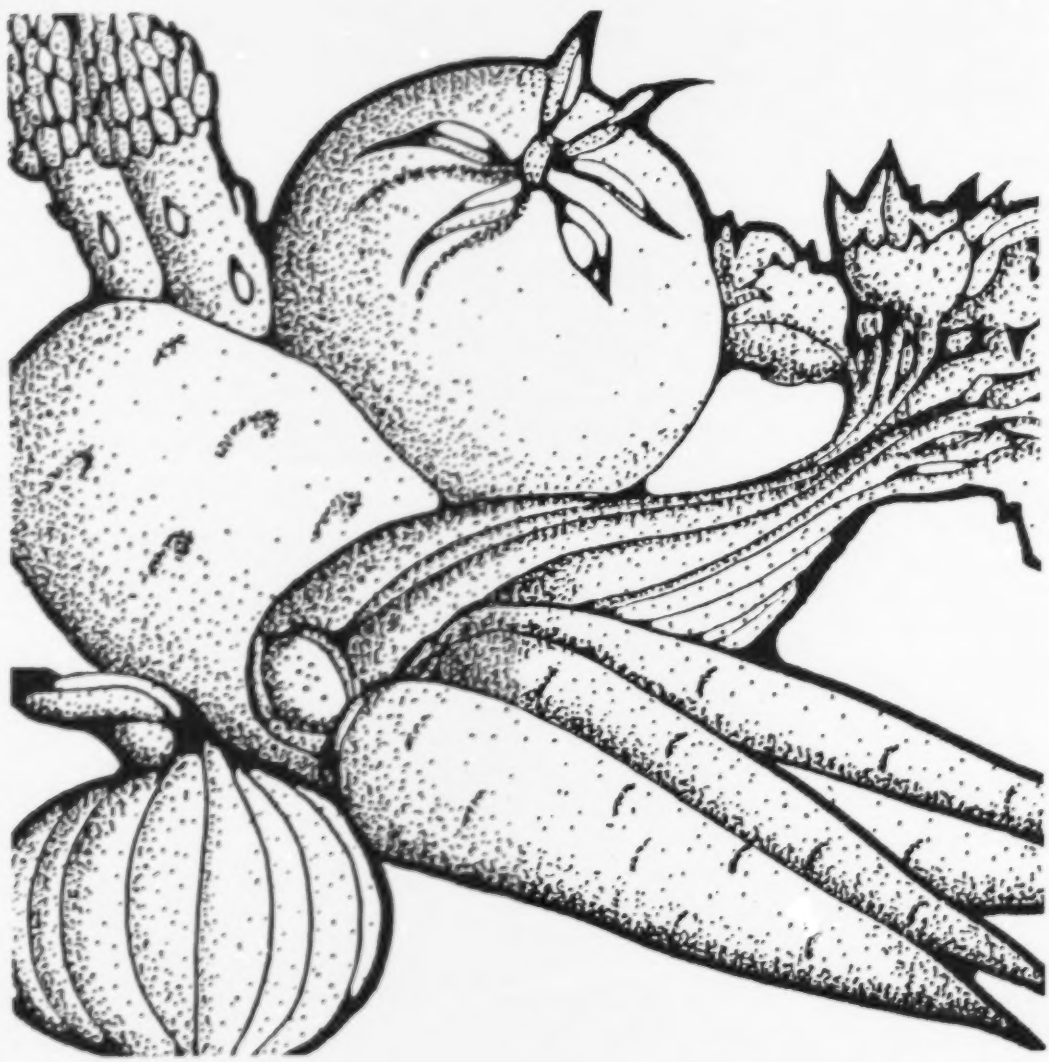
VEGETABLE CROPS: ESTIMATED PRODUCTION COSTS ONTARIO, 1989



ECONOMICS AND POLICY
COORDINATION BRANCH

ONTARIO MINISTRY OF AGRICULTURE AND FOOD
LEGISLATIVE BUILDINGS, TORONTO, ONTARIO, M7A 1B6

ECONOMICS INFORMATION

REPORT NO. 89-06

VEGETABLE CROPS

ESTIMATED PRODUCTION COSTS

ONTARIO, 1989

by

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INTRODUCTION

Since 1948, the Economics and Policy Coordination Branch has carried out comprehensive studies of major field and horticultural crops grown in Ontario. These studies were designed to determine costs and returns of various farm enterprises, as well as the physical amounts of production inputs required.

Traditionally, data was collected by means of farmer interviews. Published reports of these studies in the form of county, regional and provincial averages found a wide distribution among extension and research personnel, educational institutions, farm organizations, lending institutions and policy makers. Cooperating farmers received reports showing their individual information in comparison with group averages.

With this extensive background in the development of cost studies, the Economics and Policy Coordination Branch now use micro-computers in the preparation of cost data. Computer simulation now replaces the time consuming process of data collection, tabulation and analysis.

With this new approach, special attention is paid to the physical quantities and prices of inputs for each crop studied. The technology used in the production of various crops is carefully examined so that the computer models will accurately reflect the appropriate production technology for each commodity.

Information on inputs is obtained from a number of sources, including:

1. previous studies done by this Branch;
2. surveys of the farm supply trade;
3. technical input/output coefficients; and
4. the consensus of producers, researchers, extension and agribusiness personnel.

THE DEVELOPMENT OF THE ACRES PROGRAM

A large number of computer programs that generate budgets and crop production cost estimates are now in existence. These computer programs vary in their degree of sophistication and in the amount of detail prepared. A large number of estimates covering a wide range of conditions can be generated quickly and efficiently. The effect of varying levels of technology, management practices and price levels can also be analyzed.

Cost of production estimates used in this report are based on the ACRES program. ACRES (Agricultural Crop Enterprise System) is a FORTRAN program originally written in Montana, adapted by Alberta Agriculture, modified and rewritten by the Economics and Policy Coordination Branch to accommodate Ontario agricultural conditions. The 1989 cost of production estimates presented in this report are based on this computer model.

METHODS AND PROCEDURES

The information used in the preparation of each production cost estimate was prepared through the use of recent Economics and Policy Coordination Branch studies, plus consultation with producers, extension, research and agribusiness personnel.

For each crop cost estimate in this report, the data was organized into variable and fixed costs and totalled to arrive at the cost of production both on a per acre and per hectare basis. Variable costs are those which vary directly with the production of each crop grown. They include seed, plants, hired labour, fertilizer, herbicides, insecticides, fungicides, other materials, machinery operating costs, marketing charges and interest on operating capital. Fixed cost inputs are operator labour, management allowance, interest on land, machinery and buildings, depreciation on machinery and buildings, and other overhead cost items.

In this report, cash costs of production are also determined. Cash costs include total variable costs, interest on the debt portion of investment in tractors and machines, and other overhead costs.

LABOUR HOURS AND COSTS

The required number of labour hours was based on previous studies, as well as through discussions with those familiar with the production of each study crop. There are some crops which are harvested on a fixed rate per unit. For these crops, the labour hours and costs vary with the yield used in the cost estimate.

The operator labour hours were valued at $8.00 per hour. In addition, an allowance to management was made at the rate of 5 percent of the gross income.

The hired labour cost was calculated on a per hour basis and included benefits such as worker compensation, unemployment insurance, and the Canada Pension Plan. The rates varied according to area, crop and skill involved.

For some crops, piece work rates were used which were suggested by local farm labour pools. An allowance of 15 percent of basic earnings was added to cover benefits.

MATERIALS

The amount of each material input was based on commonly used practices. Input prices are based on averages charged by the trade in the area where the particular crop is grown. For most crops, the quantities of seed, plants, fertilizer nutrients and other inputs are given on a per hectare basis. Because of the multitude of products available, pesticides are grouped as herbicides, insecticides, fungicides, nematicides, etcetera. The cost and quantity of non-returnable containers is reported where applicable.

TRACTORS, MACHINES AND TRUCKS

Machinery complements used in the various crop production cost estimates were assumed to be five years old. Tractor and machine costs included depreciation, interest on investment, insurance, storage, repairs, fuel and lubrication. If machines were used for other farming operations, costs were adjusted based on the proportion of use on the study crop. The declining balance method of depreciation was used, and a 15 percent rate to powered and a 10 percent rate to non-powered machines was applied.

Interest on machinery investment was calculated on the assumption that the equity portion was 70 percent and the debt portion was 30 percent of the total depreciated value. For this report, interest on equity was calculated at 7.7 percent, which was the average interest rate paid by chartered banks on savings accounts. The interest on the debt portion was based on the average prime rate of 13.0 percent, plus one for a total of 14.0 percent. Insurance and storage costs for machinery were based on 1.5 percent of their purchase price.

Repair and maintenance costs for individual machines were originally based on the fact sheet, "Cost of Owning and Operating Farm Machines", Agdex 825, Ontario Ministry of Agriculture and Food, with subsequent updating based on price indices provided by Statistics Canada.

Fuel costs were based on the size of each tractor, truck or self-propelled machine used in the production operation. The following farmgate fuel prices were used: gasoline - 26.0 cents/litre; diesel - 23.0 cents/litre. The cost of oil, grease and filters was calculated at 15 percent of the fuel cost. Fuel costs are net of all 1989 Provincial and Federal rebates. The Federal Sales Tax rebate is scheduled to be reduced on January 1, 1990 for both gasoline and diesel. Also, the Federal Excise Tax rebate on gasoline is being eliminated effective January 1, 1990.

CUSTOM FARMWORK SERVICES

There are crops produced in Ontario where it is an accepted practice to use custom farmwork services to perform certain operations. Usually, these services are employed when the farmer needs specialized machines, such as harvesters, sprayers, fertilizer applicators and trucks. Most of these machines cannot be economically owned and operated by one producer. Custom costs were itemized on a per hectare or per acre basis, and obtained from report number 89-01 "A Survey of Custom Farmwork Rates Charged in Ontario, 1988".

LAND CHARGES

Determining the annual cost for land use is a controversial part of any study on production costs. During the past two decades, purchasers of farm land have been willing to pay more for it than can be justified from agricultural production. Purchasers believe the speculative aspect of land ownership in inflationary times offers benefits above those received from crop production. In deflationary times, however, this situation is reversed. For this reason, the appropriate interest rate used in calculating the interest cost on bare land for these crop production estimates is the real interest rate. The "real interest rate" is defined as the current lending rate of interest adjusted for inflation.

In this report, interest on land investment was calculated as follows:

1. The value of bare land was based on the average value for land in areas of Ontario where the production of each study crop predominates.

2. The interest rate applied was the average prime rate for 1988 of 10.8 percent discounted for the rate of inflation of 4.0 percent, which resulted in a 6.8 percent rate. It was assumed that land for all study crops would be purchased in the previous year prior to cropping.

No farm real estate taxes were charged to any study crop because of the 1989 Ontario Farm Tax Reduction Program.

BUILDING COSTS

For those crops where buildings are used in grading, packing, and/or storage, a building cost allowance was made.

The initial cost of these structures was based on the assumption that buildings were five years old.

Depreciation	%
Steel and concrete structures	2.5
Wood structures	5.0
Greenhouses	2.0

The interest on building investment was set at 5.1 percent, which was also used in calculating interest on land investment.

Repairs and Maintenance	%
Steel structures	1.0
Concrete structures	0.25
Wood structures	1.5

Insurance

0.5 percent of initial costs

The cost of machine housing was covered under tractor and machine costs.

Allowances were made for the use of picking baskets, storage bins, and other pieces of reusable equipment required in the production of certain crops.

INTEREST ON OPERATING CAPITAL

Interest on operating capital required to finance each crop was calculated from the time an expenditure was made until the time income was generated from sales. Operating capital includes the cost of materials, fuel, repairs, hired labour, and other cash items. In this study, the interest rate applied to operating capital was the average estimated prime rate for 1989 of 13.0 percent plus 1 percent for a rate of 14.0 percent.

OTHER OVERHEAD

This allowance covers such items as the study crop's share of utilities, accounting and administration costs, use of the farm automobile, and general farm maintenance.

OTHER COST CONSIDERATIONS

Depending on the crop studied, there are certain additional costs such as crop insurance, marketing board fees, grading charges and selling commissions. Costs for these were obtained from the respective Marketing Boards, Crop Insurance Commission and Ontario Grain Dealers Association.

YIELDS AND RETURNS

For each study crop presented in this report, a footnote to the table defines how the average yield and average price were calculated. For many crops the yield will vary considerably within the Province.

Additional information on average yields and prices is shown in the Appendix of this report.

GROSS MARGIN ANALYSIS

Gross margin is the amount above the variable costs that a crop contributes to the operator for his wages, management, the investment in machinery and land, and to other overhead costs. A different expected yield and/or price could considerably change the gross margin calculated.

CASH ANALYSIS

The cash analysis section estimates the returns over cash costs. Cash costs include all variable costs, as well as interest on the debt portion of tractor and machine investment, and other overhead costs.

Table 1.--Asparagus "Preplant Year" Costs: Estimated Cost of Production, Ontario 1989

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Fertilizer:		
10-20-30 400 kg/ha	114	46
Herbicides	49	20
Green manure seed	15	6
Tractor and machine costs:		
Repairs and maintenance	22	9
Fuel	17	7
Interest on operating capital	77	31
TOTAL VARIABLE COSTS	**294**	**119**
FIXED COSTS		
Operator labour, 7.4 hours/ha	59	24
Tractor and machine costs:		
Depreciation	54	22
Interest on investment	35	14
Insurance and storage	10	4
Interest on land, $4,450/ha @ 6.8% per annum	151	61
TOTAL FIXED COSTS	**309**	**125**
TOTAL "PREPLANT YEAR" COSTS	**603**	**244**

Table 2.--Asparagus "Preplant Year" Costs: Operation Costs, Ontario, 1989

Operation	Times over	Labour per ha.	Labour per ac.	Labour, tractor and machine costs per ha.	Labour, tractor and machine costs per ac.
		- hours -		- dollars -	
Plowing	1	2.47	1.0	68.55	27.74
Discing	1	1.24	.5	29.55	11.96
Seeding green manure	1	1.24	.5	32.77	13.26
Spraying herbicide	1	1.24	.5	32.67	13.22
Fertilizing	1	1.24	.5	32.77	13.26

Table 3.--Asparagus "Planting Year" Costs: Estimated Cost of Production, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 74.1 hours/ha	445	180
Fertilizer:		
Superphosphate 370 kg/ha	114	46
Ammonium nitrate 250 kg/ha	59	24
Lime, 34.6 t/ha	69	28
Insecticides	59	24
Herbicides	200	81
Roots, 27,182/ha	2,990	1,210
Custom and rentals	153	62
Tractor and machine costs:		
Repairs and maintenance	91	37
Fuel	69	28
Interest on operating capital	892	361
TOTAL VARIABLE COSTS	**5,141**	**2,081**
FIXED COSTS		
Operator labour, 24.7 hours/ha	198	80
Tractor and machine costs:		
Depreciation	188	76
Interest on investment	116	47
Insurance and storage	37	15
Interest on land, $4,450/ha @ 6.8% per annum	301	122
Other overhead	247	100
TOTAL FIXED COSTS	**1,087**	**440**
TOTAL "PLANTING YEAR" COSTS	**6,228**	**2,521**

Table 4.--Asparagus "Planting Year" Costs: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Plowing	1	2.47	1.0	68.55	27.74
Discing	2	2.47	1.0	59.11	23.92
Trenching	1	2.47	1.0	54.91	22.22
Fertilizing	1	1.24	.5	29.31	11.86
Planting	1	47.0	19.0	435.23	176.13
Replanting	1	2.47	1.0	14.83	6.00
Covering trench	1	2.47	1.0	67.26	27.22
Cultivating	2	2.47	1.0	72.20	29.22
Spraying herbicide	2	2.47	1.0	65.28	26.42
Hand hoeing	1	29.7	12.0	177.91	72.00
Fertilizing	1	1.24	.5	29.31	11.86
Spraying insecticide	2	2.47	1.0	107.14	43.36

Table 5.--Asparagus "Growth Year" Costs: Estimated Cost of Production, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 12.4 hours/ha	74	30
Fertilizer:		
15-15-15 370 kg/ha	86	35
Ammonium Nitrate 220 kg/ha	52	21
Insecticides	89	36
Fungicides	74	30
Herbicides	188	76
Tractor and machine costs:		
Repairs and maintenance	54	22
Fuel	22	9
Interest on operating capital	44	18
TOTAL VARIABLE COSTS	**683**	**277**
FIXED COSTS		
Operator labour, 9.3 hours/ha	74	30
Tractor and machine costs:		
Depreciation	84	34
Interest on investment	57	23
Insurance and storage	17	7
Interest on land, $4,450/ha @ 6.8% per annum	301	122
Other overhead	247	100
TOTAL FIXED COSTS	**780**	**316**
TOTAL "GROWTH YEAR" COSTS	**1,463**	**593**

Table 6.--Asparagus "Growth Year" Costs: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Stalk shredding	1	.62	.25	22.46	9.09
Fertilizing	2	2.47	1.0	58.56	23.70
Cultivating	1	1.24	.5	36.13	14.62
Spraying herbicide	1	1.24	.5	32.67	13.22
Spraying pesticides	3	3.71	1.5	160.74	65.05
Hand hoeing	1	12.36	5.0	74.13	30.00

Table 7.--Asparagus Preharvest and Harvest Costs for Processing Purposes: Estimated Cost of Production, Ontario, 1989

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Hired labour:		
Preharvest, 12.4 hours/ha	74	30
Harvest, 267 hours/ha	1,601	648
Fertilizer:		
15-15-15, 370 kg/ha	86	35
Ammonium Nitrate 220 kg/ha	52	21
Insecticides	89	36
Fungicides	74	30
Herbicides	188	76
Tractor and machine costs:		
Repairs and maintenance	148	60
Fuel	168	68
Building, repairs	17	7
Marketing board & administration fee	116	47
Receiving station fees	111	45
Interest on operating capital	94	38
TOTAL VARIABLE COSTS	**2,818**	**1,141**
FIXED COSTS		
Operator labour:		
Preharvest, 9.3 hours/ha	74	30
Harvest, 32.1 hours/ha	257	104
Management allowance, 5% of gross income	199	81
Tractor and machine costs:		
Depreciation	294	119
Interest on investment	185	75
Insurance and storage	79	32
Interest on land, $4,450/ha @ 6.8% per annum	301	122
Building use	217	88
Other overhead	247	100
TOTAL FIXED COSTS	**1,853**	**751**
TOTAL PREHARVEST AND HARVEST COSTS	**4,671**	**1,892**
GROSS MARGIN ANALYSIS		
(Based on assumed yields of 2,018 kg/ha or 1,800 lbs./acre and 3-year average price of $1.97/kg or $0.895/lb.)		
Gross income	3,981	1,611
Variable costs:		
Amortized establishment costs[a]	899	364
Preharvest and harvest	2,818	1,141
TOTAL	**3,717**	**1,505**
Gross margin	264	106
CASH ANALYSIS		
Gross income	3,981	1,611
Cash costs:		
Amortized establishment costs[a]	899	364
Preharvest and harvest[b]	3,147	1,274
TOTAL	**4,046**	**1,638**
Returns over cash costs	-65	-27

[a] Amortized establishment costs include preplant year costs, planting year costs, and growth year costs amortized over 15 years at a rate of 6.8 percent.

[b] Cash costs for preharvest and harvest include total variable costs plus interest on the debt portion of investment in tractors and machines of $82/ha ($33/ac.), truck insurance and other overhead costs.

Table 8.--Asparagus Preharvest and Harvest Costs for Processing Purposes: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Stalk shredding	1	.62	.25	22.46	9.09
Fertilizing	2	2.47	1.0	58.56	23.70
Cultivating	1	1.24	.5	36.13	14.62
Spraying herbicide	1	1.24	.5	32.67	13.22
Spraying pesticides	3	3.71	1.5	160.74	65.05
Hand hoeing	1	12.36	5.0	74.13	30.00
Harvesting	[a]	212.51	86.0	1,698.02	687.18
Grading and trimming	[a]	74.13	30.0	465.54	188.40
Delivery	[a]	12.36	5.0	330.13	133.60

[a] Operation performed as required.

Table 9.--Fresh Market Broccoli: Estimated Cost of Production, Ontario, 1989

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 217 hours/ha	1,290	522
Plants, 27,180/ha	652	264
Fertilizer, N - 162 kg/ha; P_2O_5 - 198 kg/ha; K_2O - 198 kg/ha	306	124
Herbicides	10	4
Insecticides	268	108
Tying bands	72	29
Crates, non-returnable, 692/ha	865	350
Use of picking bins	479	194
Custom packing and icing	2,076	840
Tractor and machine costs:		
Repairs and maintenance	94	38
Fuel	126	51
Interest on operating capital	217	88
TOTAL VARIABLE COSTS	**6,455**	**2,612**
FIXED COSTS		
Operator labour, 32.5 hours/ha	259	105
Management allowance, 5% of gross income	435	176
Tractor and machine costs:		
Depreciation	227	92
Interest on investment	141	57
Insurance and storage	64	26
Interest on land, $4,448/ha @ 6.8% per annum	301	122
Other overhead	62	25
TOTAL FIXED COSTS	**1,489**	**603**
TOTAL ALL COSTS	**7,944**	**3,215**
COST PER UNIT (Based on average yields of 8.3 tonnes/ha and 3.7 tons/ac.)[a]	**957.11/tonne**	**868.92/ton**
GROSS MARGIN ANALYSIS (Based on average prices of $1,047.00/tonne and $950.00/ton)[b]		
Gross Income	8,690	3,515
Total variable costs	6,455	2,612
Gross margin	2,235	903
CASH ANALYSIS		
Gross income	8,690	3,515
Cash costs[c]	6,578	2,662
Returns over cash costs	2,112	853

[a] Five-year average yields for 1984-88.
[b] Industry estimate ($950.00 per ton)
[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $61/ha ($25/acre) plus other overhead costs.

Table 10.--Fresh Market Broccoli: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Plowing	1	.99	.40	33.26	13.46
Discing	1	.49	.20	16.33	6.61
Spreading fertilizer	1	.62	.25	14.04	5.68
Spraying herbicide	1	.37	.15	8.72	3.53
Cultivate and level	1	.49	.20	15.52	6.28
Haul plants and water	[a]	2.47	1.00	56.07	22.69
Planting	1	29.65	12.00	364.53	147.52
Row cultivating	2	2.47	1.00	57.67	23.34
Hand hoeing (labour only)	1	37.06	15.00	213.12	86.25
Spray insecticides	5	1.85	.75	43.54	17.62
Row cultivate and side-dress fertilizer	1	.49	.20	12.75	5.16
Harvesting (labour only)	[a]	160.62	65.00	963.69	390.00
Harvesting (machine only)	[a]	--	--	72.89	29.50
Custom pack & icing	[a]	--	--	2,075.68	840.00
Loading and hauling to market[b]	[a]	12.35	5.00	330.13	133.60

[a] Operation performed as required.

[b] Hauling to market by use of a truck.

Table 11.--Fresh Market Cabbage: Estimated Cost of Production, Ontario, 1989

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 173 hours/ha	1,028	416
Plants, 29,652/ha	563	228
Fertilizer, N - 169 kg/ha; P_2O_5 - 225 kg/ha; K_2O - 112 kg/ha	309	125
Herbicide	12	5
Insecticides	203	82
Crates, non-returnable, 1,606/ha	2,009	813
Tractor and machine costs:		
Repairs and maintenance	64	26
Fuel	52	21
Interest on operating capital	148	60
TOTAL VARIABLE COSTS	**4,388**	**1,776**
FIXED COSTS		
Operator labour, 22 hours/ha	173	70
Management allowance, 5% of gross income	385	156
Tractor and machine costs:		
Depreciation	136	55
Interest on investment	86	35
Insurance and storage	35	14
Interest on land, $4,448/ha @ 6.8% per annum	301	122
Other overhead	62	25
TOTAL FIXED COSTS	**1,178**	**477**
TOTAL ALL COSTS[a]	**5,566**	**2,253**
COST PER UNIT (Based on average yields of 32.1 tonnes/ha and 14.3 tons/acre)[b]	**173.40/tonne**	**157.55/ton**
GROSS MARGIN ANALYSIS (Based on average prices of $241.34/tonne and $219.00/ton)[c]		
Gross income	7,747	3,132
Total variable costs	4,388	1,776
Gross margin	3,359	1,356
CASH ANALYSIS		
Gross income	7,747	3,132
Cash costs[d]	4,488	1,817
Returns over cash costs	3,259	1,315

[a] Storage costs not considered.
[b] Five-year average yields for 1984-88.
[c] Five-year average prices 1984-88.
[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $38/ha ($16/acre) plus other overhead costs.

Table 12.--Fresh Market Cabbage: Operation Costs, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Plowing	1	.99	.40	33.26	13.46
Discing	1	.49	.20	16.33	6.61
Spread fertilizer	1	.37	.15	7.51	3.04
Spray herbicide	1	.37	.15	7.93	3.21
Cultivate and level	1	.49	.20	15.42	6.24
Haul plants and water	[a]	1.24	.50	28.07	11.36
Planting	1	29.65	12.00	343.77	139.12
Spray insecticides	5	1.85	.75	39.63	16.04
Row cultivate	1	.49	.20	10.50	4.25
Row cultivate and sidedress	1	.49	.20	11.71	4.74
Hand Hoeing (labour only)	1	17.30	7.00	99.46	40.25
Harvest and pack (labour only)	[a]	135.90	55.00	815.43	330.00
Load and haul to market[b]	[a]	4.94	2.00	147.42	59.66

[a] Operation performed as required.

[b] Hauling to market by use of a truck.

Table 13.--Fresh Market Carrots: Estimated Cost of Production, on Muck Soils, Ontario, 1989

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 52.5 hours/ha	390	158
Seed, pelleted, 1,600,000/ha	467	189
Fertilizer, N - 67 kg/ha; P_2O_5 - 33 kg/ha; K_2O - 167 kg/ha	136	55
Herbicides	202	82
Insecticides	154	62
Fungicides	87	35
Tractor and machine costs:		
Repairs and maintenance	573	232
Fuel	282	114
Pallet box repairs	91	37
Storage building repairs and maintenance	77	31
Electricity in storage	67	27
Interest on operating capital	250	101
TOTAL VARIABLE COSTS	**2,776**	**1,123**
FIXED COSTS		
Operator labour, 54.6 hours/ha	437	177
Management allowance, 5% of gross income	343	139
Tractor and machine costs:		
Depreciation	726	294
Interest on investment	457	185
Insurance and storage	193	78
Pallet box use	710	288
Storage building,interest,depreciation,insurance	413	167
Interest on land, $17,297/ha @ 6.8% per annum	1,176	476
Other overhead	62	25
TOTAL FIXED COSTS	**4,517**	**1,829**
TOTAL ALL COSTS[a]	**7,293**	**2,952**
COST PER UNIT (Based on average yields of 58.18 tonnes/ha and 25.95 tons/acre)[b]	**125.35/tonne**	**113.75/ton**
GROSS MARGIN ANALYSIS (Based on average prices of $117.73/tonne and $106.80/ton)[c]		
Gross income	6,850	2,771
Total variable costs	2,776	1,123
Gross margin	4,074	1,648
CASH ANALYSIS		
Gross income	6,850	2,771
Cash costs[d]	3,039	1,229
Returns over cash costs	3,811	1,542

[a] Carrots delivered to shipper in bulk bins, no grading and packaging costs are included.
[b] Five-year average yields 1984-88.
[c] Three-year average prices 1986-88.
[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $201/ha ($81/acre) plus other overhead costs.

Table 14.--Fresh Market Carrots on Muck Soils: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Fall discing	1	1.24	.50	37.34	15.11
Spring discing	1	1.24	.50	37.34	15.11
Spread fertilizer	1	.82	.33	36.79	14.89
Spray herbicide	7	6.05	2.45	273.56	110.71
Seedbed preparation	1	.82	.33	27.01	10.93
Seeding	1	4.94	2.00	177.49	71.83
Spray insecticides and fungicides	6	5.19	2.10	234.50	94.90
Hand weeding	1	9.88	4.00	59.30	24.00
Row cultivate	1	2.47	1.00	37.14	15.03
Irrigate	1	6.60	2.67	136.84	55.38
Hand harvest	1	4.94	2.00	29.65	12.00
Combine	1	35.79	14.49	1,057.98	428.16
Haul and unload at farm storage	1	13.84	5.60	304.90	123.39
Load and haul to market	[a]	13.34	5.40	374.01	151.36

[a] Operation performed as required.

Table 15.--Fresh Market Cauliflower: Estimated Cost of Production, Ontario, 1989

	Cost per hectare	Cost per acre
		- dollars -
VARIABLE COSTS		
Hired labour, 341 hours/ha	2,011	814
Plants, 21,004/ha	442	179
Fertilizer, N - 162 kg/ha; P_2O_5 - 198 kg/ha; K_2O - 198 kg/ha	306	124
Herbicides	10	4
Insecticides	194	78
Tying bands	84	34
Crates, non-returnable, 1,235	1,544	625
Tractor and machine costs:		
Repairs and maintenance	84	34
Fuel	116	47
Interest on operating capital	168	68
TOTAL VARIABLE COSTS	**4,959**	**2,007**
FIXED COSTS		
Operator labour, 32.5 hours/ha	259	105
Management allowance, 5% of gross income	460	186
Tractor and machine costs:		
Depreciation	198	80
Interest on investment	124	50
Insurance and storage	59	24
Interest on land, $4,448/ha @ 6.8% per annum	301	122
Other overhead	62	25
TOTAL FIXED COSTS	**1,463**	**592**
TOTAL ALL COSTS[a]	**6,422**	**2,599**
COST PER UNIT (Based on average yields of 19.3 tonnes/ha and 8.6 tons/ac.)[b]	**332.75/tonne**	**302.21/ton**
GROSS MARGIN ANALYSIS (Based on average prices of $476.06/tonne and $432.00/ton)[c]		
Gross income	9,188	3,715
Total variable costs	4,959	2,007
Gross margin	4,229	1,708
CASH ANALYSIS		
Gross income	9,188	3,715
Cash costs[d]	5,075	2,054
Returns over cash costs	4,113	1,661

[a] Cauliflower is packed into crates at the farm before being hauled to shipper.
[b] Five-year average yields for 1984-88.
[c] Five-year average prices 1984-88.
[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $54/ha ($22/acre) plus other overhead costs.

Table 16.--Fresh Market Cauliflower: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Plowing	1	.99	.40	33.26	13.46
Discing	1	.49	.20	16.33	6.61
Spread fertilizer	1	.62	.25	14.04	5.68
Spray herbicide	1	.37	.15	8.72	3.53
Cultivate and level	1	.49	.20	15.52	6.28
Haul plants and water	[a]	2.47	1.00	56.07	22.69
Planting	1	29.65	12.00	364.53	147.52
Row cultivate	2	2.47	1.00	57.67	23.34
Hand hoeing (labour only)	1	37.06	15.00	213.12	86.25
Spray insecticides	5	1.85	.75	43.54	17.62
Row cultivate and side-dress fertilizer	1	.49	.20	12.75	5.16
Tying heads	1	86.49	35.00	497.29	201.25
Harvesting (labour only)	[a]	185.32	75.00	1,111.95	450.00
Load and haul to market[b]	[a]	24.70	10.00	404.26	163.60

[a] Operation performed as required.

[b] Hauling to market by use of a truck.

Table 17.--Fresh Market Celery (Hand Harvest): Estimated Cost of Production on Muck Soils, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 313 hours/ha	2,469	999
Seedlings, 66,700/ha	890	360
Fertilizer, N - 202 kg/ha; P_2O_5 - 202 kg/ha; K_2O - 605 kg/ha	494	200
Herbicide	74	30
Insecticides	220	89
Fungicides	156	63
Cartons, non-returnable, 2,240	3,358	1,359
Tractor and machine costs:		
Repairs and maintenance	452	183
Fuel	445	180
Interest on operating capital	499	202
TOTAL VARIABLE COSTS	**9,057**	**3,665**
FIXED COSTS		
Operator labour, 74 hours/ha	593	240
Management allowance, 5% of gross income	776	314
Tractor and machine costs:		
Depreciation	761	308
Interest on investment	494	200
Insurance and storage	299	121
Interest on land, $17,297/ha @ 6.8% per annum	1,176	476
Other overhead	62	25
TOTAL FIXED COSTS	**4,161**	**1,684**
TOTAL ALL COSTS[a]	**13,218**	**5,349**
COST PER UNIT (Based on average yields of 72.4 tonnes/ha and 32.3 tons/acre)[b]	**182.57/tonne**	**165.60/ton**
GROSS MARGIN ANALYSIS (Based on average prices of $214.64/tonne and $194.60/ton)[c]		
Gross income	15,540	6,286
Total variable costs	9,057	3,665
Gross margin	6,483	2,621
CASH ANALYSIS		
Gross income	15,540	6,286
Cash costs[d]	9,335	3,777
Returns over cash costs	6,205	2,509

[a] Includes costs of hand harvesting, washing and packing into crates at farm before delivery to shipper.

[b] Five-year average yields 1984-88.

[c] Three-year average prices 1986-88.

[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $216/ha ($87/acre) plus other overhead costs.

Table 18.--Fresh Market Celery, (Hand Harvest) on Muck Soils: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Fall disc	1	1.01	.41	30.64	12.40
Spring Disc	2	1.46	.59	44.08	17.84
Spread fertilizer	1	.82	.33	36.79	14.89
Seedbed preparation	1	1.43	.58	47.47	19.21
Haul plants	1	.25	.10	4.65	1.88
Plant in field	1	83.20	33.67	1,574.82	637.32
Hand weed	1	17.77	7.19	106.60	43.14
Sidedress	1	4.40	1.78	134.92	54.60
Irrigate	[a]	16.56	6.70	343.35	138.95
Spray herbicides	1	.91	.37	41.32	16.72
Spray insecticides and fungicides	9	10.30	4.17	465.64	188.44
Cut and field pack	[a]	212.04	85.81	1,761.61	712.91
Load and haul to market	[a]	37.06	15.00	919.90	372.28

[a] Operation performed as required.

Table 19.--Head Lettuce: Estimated Cost of Production, on Muck Soils, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 339 hours/ha	2,488	1,007
Seed, pelleted, 247,100/ha	121	49
Fertilizer, N - 90 kg/ha; P_2O_5 - 90 kg/ha; K_2O - 180 kg/ha	220	89
Insecticides	475	192
Fungicides	77	31
Tractor and machine costs:		
Repairs and maintenance	287	116
Fuel	257	104
Crates, non-returnable, 1,000	3,410	1,380
Interest on operating capital	514	208
TOTAL VARIABLE COSTS	**7,849**	**3,176**
FIXED COSTS		
Operator labour, 56 hours/ha	415	168
Management allowance, 5% of gross income	467	189
Tractor and machine costs:		
Depreciation	343	139
Interest on investment	225	91
Insurance and storage	156	63
Interest on land, $17,297/ha @ 6.8% per annum	1,176	476
Other overhead	62	25
TOTAL FIXED COSTS	**2,844**	**1,151**
TOTAL ALL COSTS[a]	**10,693**	**4,327**
COST PER UNIT (Based on average yields of 2,965 doz./ha and 1,200 doz./acre)[b]	**3.61/doz.**	**3.61/doz.**
GROSS MARGIN ANALYSIS (Based on average prices of $3.15/doz.)[c]		
Gross income	9,340	3,780
Total variable costs	7,849	3,176
Gross margin	1,491	604
CASH ANALYSIS		
Gross income	9,340	3,780
Cash costs[d]	8,009	3,241
Returns over cash costs	1,331	539

[a] Includes costs of harvesting, packing into crates and delivery to shipper.
[b] Five-year average yields for 1984-88.
[c] Three-year average prices 1986-88.
[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $98/ha ($40/acre) plus other overhead costs.

Table 20.--Head Lettuce on Muck Soils: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Fall disc	1	1.06	.43	34.54	13.98
Spring disc	1	1.06	.43	34.54	13.98
Spread fertilizer	1	1.11	.45	49.49	20.03
Seedbed preparation	1	1.41	.57	42.67	17.27
Seeding	1	7.09	2.87	214.56	86.83
Hand thinning	1	80.31	32.50	481.85	195.00
Irrigate	1	6.92	2.80	181.84	73.59
Spray insecticides	7	6.47	2.62	288.66	116.82
Spray fungicides	5	4.62	1.87	206.06	83.39
Hand hoeing	1	32.91	13.32	197.48	79.92
Row cultivate and sidedress	2	11.37	4.60	164.02	66.38
Hand Weed	[a]	32.91	13.32	197.48	79.92
Harvest and pack	[a]	226.10	91.50	1,862.05	753.56
Haul to market	[a]	15.12	6.12	410.43	166.10

[a] Operation performed as required.

Table 21.--Peppers for Fresh Market: Estimated Cost of Production, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 180 hours/ha	1,075	435
Plants, 27,181/ha	571	231
Fertilizer, N - 204 kg/ha; P_2O_5 - 168 kg/ha; K_2O - 168 kg/ha	245	99
Herbicides	15	6
Insecticides	173	70
Fungicides	94	38
Crates, non-returnable, 1,285/ha	1,324	536
Tractor and machine costs:		
Repairs and maintenance	121	49
Fuel	94	38
Interest on operating capital	131	53
TOTAL VARIABLE COSTS	**3,843**	**1,555**
FIXED COSTS		
Operator labour, 42.5 hours/ha	341	138
Management allowance, 5% of gross income	252	102
Tractor and machine costs:		
Depreciation	235	95
Interest on investment	146	59
Insurance and storage	59	24
Interest on land, $4,448/ha @ 6.8% per annum	301	122
Other overhead	62	25
TOTAL FIXED COSTS	**1,396**	**565**
TOTAL ALL COSTS	**5,239**	**2,120**
COST PER UNIT (Based on average yields of 11.4 tonnes/ha and 5.1 tons/acre)[a]	**459.56/tonne**	**415.69/ton**
GROSS MARGIN ANALYSIS (Based on average prices of $440.80/tonne and $400.00/ton)[b]		
Gross income	5,025	2,040
Total variable costs	3,843	1,555
Gross margin	1,182	485
CASH ANALYSIS		
Gross income	5,025	2,040
Cash costs[c]	3,969	1,606
Returns over cash costs	1,056	434

[a] Five-year average yields for 1984-88.
[b] Five-year average prices 1984-88.
[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $64/ha ($26/acre) plus other overhead costs.

Table 22.--Peppers for Fresh Market: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Plowing	1	1.48	.60	49.94	20.21
Discing	1	.99	.40	32.64	13.21
Spread fertilizer	1	.99	.40	20.02	8.10
Spray herbicide	1	.99	.40	21.13	8.55
Cultivate and level	1	.99	.40	30.86	12.49
Haul plants and water	[a]	2.97	1.20	69.39	28.08
Planting	1	17.79	7.20	206.23	83.46
Row cultivate	2	2.47	1.00	50.85	20.58
Hand hoeing (labour only)	1	17.30	7.00	99.46	40.25
Row cultivate and sidedress fertilizer	1	1.48	.60	34.15	13.82
Spray insecticides	7	6.92	2.80	147.99	59.89
Spray fungicides	3	2.97	1.20	63.43	25.67
Harvest and pack (labour only)	[a]	128.49	52.00	770.95	312.00
Load in field	[a]	29.65	12.00	413.45	167.32
Haul to market (labour only)	[a]	7.41	3.00	59.30	24.00

[a] Operation performed as required.

Table 23.--Fresh Market Potatoes: Estimated Cost of Production, Ontario, 1989

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 24.1 hours/ha	208	84
Seed, potato	618	250
Seed, rye	15	6
Seed treatment	30	12
Fertilizer, N - 168 kg/ha; P_2O_5 - 168 kg/ha; K_2O - 168 kg/ha	262	106
Herbicides	94	38
Insecticides	141	57
Fungicides	143	58
Topkill	62	25
Tractor and machine costs:		
Repairs and maintenance	247	100
Fuel	148	60
Marketing fees	44	18
Interest on operating capital	213	86
TOTAL VARIABLE COSTS	**2,225**	**900**
FIXED COSTS		
Operator labour, 10.9 hours/ha	86	35
Management allowance, 5% of gross income	183	74
Tractor and machine costs:		
Depreciation	170	69
Interest on investment	106	43
Insurance and storage	40	16
Interest on land, $3,707/ha @ 6.8% per annum	252	102
Other overhead	37	15
TOTAL FIXED COSTS	**874**	**354**
TOTAL ALL COSTS[a]	**3,099**	**1,254**
COST PER UNIT (Based on average yields of 19.05 tonnes/ha and 170 cwt/acre)[b]	**162.68/tonne**	**7.38/cwt.**
GROSS MARGIN ANALYSIS (Based on average prices of $192.90/tonne and $8.75/cwt)[c]		
Gross income	3,675	1,488
Total variable costs	2,225	900
Gross margin	1,450	588
CASH ANALYSIS		
Gross income	3,675	1,488
Cash costs[d]	2,311	935
Returns over cash costs	1,364	553

[a] Does not include storage and marketing costs.
[b] Based on four-year's average yield, 1985-88.
[c] Price estimated based on three year's average return, 1986-88.
[d] Cash costs include variable costs, plus interest on debt portion of investment in tractors and machines of $49/ha ($20/acre) plus other overhead costs.

Table 24.--Fresh Market Potatoes: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Fall disc	2	1.06	.43	37.26	15.08
Plant rye	1	.30	.12	12.60	5.10
Spring disc	1	.54	.22	19.62	7.94
Field cultivate	2	1.24	.50	43.42	17.57
Cutting seed	1	.64	.26	19.55	7.91
Haul fertilizer and seed	1	1.24	.50	54.88	22.21
Planting	1	4.94	2.00	61.06	24.71
Row cultivate	1	.69	.28	20.61	8.34
Hilling	1	.69	.28	21.84	8.84
Spray herbicide	1.5	.74	.30	30.84	12.48
Spray insecticide and fungicide	6	2.45	.99	101.73	41.17
Spray topkill	1.5	.42	.17	17.47	7.07
Windrow[a]	1	3.95	1.60	162.97	65.95
Harvest with combine	1	5.93	2.40	118.17	47.82
Haul to storage	1	5.93	2.40	185.33	74.32
Unload and grade	1	5.93	2.40	76.26	30.86

[a] Two machines used.

Table 25.--Sweet Corn for Fresh Market (Hand Harvest): Estimated Cost of Production, Ontario, 1989

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 95 hours/ha	573	232
Seed, 13.5 kg/ha	131	53
Fertilizer, N - 126 kg/ha; P_2O_5 - 64 kg/ha; K_2O - 74 kg/ha	146	59
Herbicide	52	21
Insecticide	116	47
Crates, non-returnable, 420/ha	358	145
Tractor and machine costs:		
Repairs and maintenance	67	27
Fuel	57	23
Custom work	12	5
Interest on operating capital	52	21
TOTAL VARIABLE COSTS	**1,564**	**633**
FIXED COSTS		
Operator labour, 13 hours/ha	106	43
Management allowance, 5% of gross income	128	52
Tractor and machine costs:		
Depreciation	143	58
Interest on investment	91	37
Insurance and storage	32	13
Interest on land, $4,448/ha @ 6.8% per annum	301	122
Other overhead	62	25
TOTAL FIXED COSTS	**863**	**350**
TOTAL ALL COSTS[a]	**2,427**	**983**
COST PER UNIT (Based on average yields of 1,977 doz./ha and 800 doz./acre)[b]	**1.23/doz**	**1.23/doz**
GROSS MARGIN ANALYSIS (Based on average prices of $1.30/doz.)[c]		
Gross income	2,570	1,040
Total variable costs	1,564	633
Gross margin	1,006	407
CASH ANALYSIS		
Gross income	2,570	1,040
Cash costs[d]	1,666	674
Returns over cash costs	904	366

[a] Sweet corn is hand harvested and packed into crates at the farm before being hauled to shipper.

[b] Five-year average yields 1984-88.

[c] Five-year average prices 1984-88.

[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $40/ha ($16/acre) plus other overhead costs.

Table 26.--Sweet Corn for Fresh Market (Hand Harvest): Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Plowing	1	.79	.32	26.64	10.78
Discing	1	.99	.40	32.64	13.21
Spread fertilizer	1	.99	.40	20.02	8.10
Spray herbicide	1	.99	.40	21.13	8.55
Cultivate and harrow	1	.99	.40	31.01	12.55
Haul seed and fertilizer	[a]	.30	.12	6.38	2.58
Planting	1	.59	.24	27.38	11.08
Row cultivate	2	1.58	.64	32.57	13.18
Custom apply "N" and herbicide	1	--	--	11.74	4.75
Spray insecticides	4	3.95	1.60	84.58	34.23
Pick and haul to farm yard	[a]	69.20	28.00	415.13	168.00
Sort and pack (labour only)	[a]	24.70	10.00	148.26	60.00
Haul to market[b]	[a]	2.47	1.00	73.71	29.83
Disc down stalks	1	.99	.40	31.41	12.71

[a] Operation performed as required.

[b] Using a truck.

-- Not applicable.

Table 27.--Field Tomatoes for Fresh Market: Estimated Cost of Production, Ontario, 1989

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 417 hours/ha	2,493	1,009
Plants, 24,710/ha	578	234
Fertilizer: Plant Starter 6-24-24, 49 litres/ha	12	5
N - 225 kg/ha; P_2O_5 - 93 kg/ha; K_2O - 270 kg/ha	235	95
Herbicide	10	4
Insecticide	49	20
Fungicide	156	63
Containers, non-returnable, 2,224/ha	3,736	1,512
Use of picking baskets	49	20
Tractor and machine costs:		
Repairs and maintenance	175	71
Fuel	173	70
Interest on operating capital	269	109
TOTAL VARIABLE COSTS	**7,935**	**3,212**
FIXED COSTS		
Operator labour, 38 hours/ha	304	123
Management allowance, 5% of gross income	586	237
Tractor and machine costs:		
Depreciation	381	154
Interest on investment	230	93
Insurance and storage	94	38
Interest on land, $4,448/ha @ 6.8% per annum	301	122
Other overhead	62	25
TOTAL FIXED COSTS	**1,958**	**792**
TOTAL ALL COSTS[a]	**9,893**	**4,004**
COST PER UNIT (Based on average yields of 24.1 tonnes/ha and 10.75 ton/acre)[b]	**410.50/tonne**	**372.47/ton**
GROSS MARGIN ANALYSIS (Based on average prices of $484.88/tonne and $440.00/ton)[c]		
Gross income	11,686	4,730
Total variable costs	7,935	3,212
Gross margin	3,751	1,518
CASH ANALYSIS		
Gross income	11,686	4,730
Cash costs[d]	8,098	3,278
Returns over cash costs	3,588	1,452

[a] Tomatoes are graded and packed into containers at farm before being shipped to dealer.
[b] Five-year average yields for 1984-88.
[c] Five-year average prices 1984-88.
[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $101/ha ($41/acre) plus other overhead costs.

Table 28.--Field Tomatoes for Fresh Market: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Plowing	1	1.48	.60	49.94	20.21
Discing	1	.99	.40	32.64	13.21
Spread fertilizer	1	.99	.40	20.02	8.10
Spray herbicide	1	.99	.40	21.13	8.55
Field cultivate and level	1	.99	.40	30.86	12.49
Haul plants and water	[a]	1.98	.80	44.85	18.15
Planting	1	17.79	7.20	206.23	83.46
Row cultivate	1	.99	.40	20.34	8.23
Hand hoeing (labour only)	1	24.71	10.00	142.08	57.50
Row cultivate and sidedress	1	2.97	1.20	68.30	27.64
Spray for insect and disease control	6	5.93	2.40	126.84	51.33
Harvest and pack	[a]	380.53	154.00	2,642.73	1,069.50
Haul to market[b]	[a]	14.83	6.00	442.26	178.98

[a] Operation performed as required.

[b] Using a truck.

Table 29.--Yellow Seed Onions: Estimated Cost of Production, on Muck Soils, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 76.0 hours/ha	546	221
Seed, pelleted, treated, 988,400/ha	890	360
Fertilizer, N - 105 kg/ha; P_2O_5 - 158 kg/ha; K_2O - 210 kg/ha	220	89
Herbicides	371	150
Insecticides	84	34
Fungicides	69	28
Sprout inhibitor	124	50
Plastic covers	30	12
Tractor and machine costs:		
Repairs and maintenance	566	229
Fuel	284	115
Pallet box repairs	198	80
Storage building and repairs	59	24
Electricity, used in storage	42	17
Interest on operating capital	358	145
TOTAL VARIABLE COSTS	**3,841**	**1,554**
FIXED COSTS		
Operator labour, 54.9 hours/ha	440	178
Management allowance, 5% of gross income	516	209
Tractor and machine costs:		
Depreciation	722	292
Interest on investment	521	211
Insurance and storage	198	80
Pallet box use	499	202
Storage building,interest,depreciation,insurance	316	128
Interest on land, $17,297/ha @ 6.8% per annum	1,176	476
Other overhead	62	25
TOTAL FIXED COSTS	**4,450**	**1,801**
TOTAL ALL COSTS[a]	**8,291**	**3,355**
COST PER UNIT	**188.43/tonne**	**171.17/ton**
(Based on average yields of 44.0 tonnes/ha and 19.6 tons/acre)[b]		
GROSS MARGIN ANALYSIS		
(Based on average prices of $234.95/tonne and $213.20/ton)[c]		
Gross income	10,338	4,179
Total variable costs	3,841	1,554
Gross margin	6,497	2,625
CASH ANALYSIS		
Gross income	10,338	4,179
Cash costs[d]	4,132	1,672
Returns over cash costs	6,206	2,507

[a] Onions are delivered to shipper in bulk bins, costs of grading and bagging are not included.

[b] Five-year average yields for 1984-88.

[c] Three-year average prices 1986-88.

[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $229/ha ($93/acre) plus other overhead costs.

Table 30.--Yellow Seed Onions on Muck Soils: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Fall disc	1	1.24	.50	40.92	16.56
Spring disc	1	1.24	.50	40.92	16.56
Spread fertilizer	1	.82	.33	24.04	9.73
Seedbed preparation	1	.82	.33	25.20	10.20
Seeding (onion maggot control)	1	5.58	2.26	199.88	80.89
Spray herbicides	7	6.00	2.43	271.34	109.81
Spray insecticides	5	4.30	1.74	194.29	78.63
Spray fungicides	5	4.30	1.74	194.29	78.63
Spray sprout inhibitor	1	.86	.35	39.07	15.81
Irrigate	[a]	14.83	6.00	307.49	124.44
Hand weed	1	30.94	12.52	185.62	75.12
Row cultivate	1	2.47	1.00	37.14	15.03
Pull and windrow	1	3.43	1.39	49.79	20.15
Combine	1	27.06	10.95	890.37	360.33
Stack pallet boxes in field	[a]	5.49	2.22	83.94	33.97
Cover pallet boxes	[a]	1.78	.72	14.23	5.76
Haul to storage	[a]	4.94	2.00	143.12	57.92
Unload at storage	[a]	3.01	1.22	49.17	19.90
Load and haul to market	[a]	11.81	4.78	320.98	129.90

[a] Operation performed as required.

Table 31.--Cabbage for Processing: Estimated Cost of Production, Ontario, 1989

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 37 hours/ha	213	86
Plants, 23,475/ha[a]	400	162
Fertilizer, N - 169 kg/ha; P_2O_5 - 225 kg/ha; K_2O - 112 kg/ha	309	125
Herbicide	12	5
Insecticides	173	70
Tractor and machine costs:		
Repairs and maintenance	77	31
Fuel	72	29
Custom harvest and haul	477	193
Marketing fees	25	10
Interest on operating capital	20	8
TOTAL VARIABLE COSTS	**1,778**	**719**
FIXED COSTS		
Operator labour, 16.4 hours/ha	131	53
Management allowance, 5% of gross income	106	43
Tractor and machine costs:		
Depreciation	124	50
Interest on investment	82	33
Insurance and storage	25	10
Interest on land, $4,448/ha @ 6.8% per annum	301	122
Other overhead	62	25
TOTAL FIXED COSTS	**831**	**336**
TOTAL ALL COSTS[a]	**2,609**	**1,055**
COST PER UNIT (Based on average yields of 33.6 tonnes/ha and 15.0 tons/acre)[b]	**77.65/tonne**	**70.33/ton**
GROSS MARGIN ANALYSIS (Based on average prices of $62.79/tonne and $56.98/ton)[c]		
Gross income	2,110	855
Total variable costs	1,778	719
Gross margin	332	136
CASH ANALYSIS		
Gross income	2,110	855
Cash costs[d]	1,876	759
Returns over cash costs	234	96

[a] Number of plants per hectare, however plant costs reflect only 90% of the total plant costs, as processor supplies plants for early crop and the grower for the late crop.

[b] Five-year average yields for 1984-88.

[c] 1989 contract price.

[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $36/ha ($15/acre) plus other overhead costs.

Table 32.--Cabbage for Processing: Operation Costs, Ontario, 1989

Operation	Times over	Labour per ha.	Labour per ac.	Labour, tractor and machine costs per ha.	Labour, tractor and machine costs per ac.
		- hours -		- dollars -	
Plowing	1	.99	.40	41.66	16.86
Discing	1	.37	.15	19.37	7.84
Spread fertilizer	1	.37	.15	9.71	3.93
Spray herbicide	1	.37	.15	10.60	4.29
Field cultivate harrow, and pack	2	.74	.30	33.70	13.64
Haul plants & water	[a]	1.24	.50	38.55	15.60
Planting	1	29.65	12.00	402.68	162.96
Spray insecticides	4	1.48	.60	42.48	17.19
Row cultivate	1	.49	.20	13.44	5.44
Hand hoeing (labour only)	1	17.30	7.00	99.46	40.25
Row cultivate and sidedress fertilizer	1	.49	.20	14.65	5.93
Custom harvest & deliver	1	--	--	476.78	192.95

[a] Operation performed as required.

Table 33.--Cucumbers for Processing: Estimated Cost of Production, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 541 hours/ha	2,847	1,152
Seed, 3.36 kg/ha	96	39
Fertilizer, N - 118 kg/ha; P_2O_5 - 168 kg/ha; K_2O - 168 kg/ha	245	99
Insecticide	42	17
Fungicide	133	54
Tractor and machine costs:		
Repairs and maintenance	59	24
Fuel	57	23
Bee rental	67	27
Use of picking baskets	89	36
Crop insurance	74	30
Marketing and grading fees	59	24
Interest on operating capital	44	18
TOTAL VARIABLE COSTS	**3,812**	**1,543**
FIXED COSTS		
Operator labour, 13.7 hours/ha	109	44
Management allowance, 5% of gross income	235	95
Tractor and machine costs:		
Depreciation	94	38
Interest on investment	59	24
Insurance and storage	20	8
Interest on land, $4,448/ha @ 6.8% per annum	301	122
Other overhead	62	25
TOTAL FIXED COSTS	**880**	**356**
TOTAL ALL COSTS	**4,692**	**1,899**
COST PER UNIT (Based on average yields of 20.4 tonnes/ha and 9.1 tons/acre)[a]	**230.00/tonne**	**208.68/ton**
GROSS MARGIN ANALYSIS (Based on average prices of $229.22/tonne and $208.00/ton)[b]		
Gross income	4,676	1,893
Total variable costs	3,812	1,543
Gross margin	864	350
CASH ANALYSIS		
Gross income	4,676	1,893
Cash costs[c]	3,900	1,579
Returns over cash costs	776	314

[a] Five-year average yields for 1984-88.
[b] 1989 price based on 1988 average price, increased by 4%.
[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $26/ha. ($11/acre) plus other overhead costs.

Table 34.--Cucumbers for Processing: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Plowing	1	.99	.40	41.66	16.86
Discing	1	.37	.15	19.37	7.84
Spread fertilizer	1	.37	.15	9.71	3.93
Cultivate, harrow and pack	1	.37	.15	16.83	6.81
Planting	1	.99	.40	36.20	14.65
Hand hoeing (labour only)	1	17.30	7.00	95.13	38.50
Row cultivate	1	.49	.20	13.44	5.44
Spray fungicides	3	1.11	.45	31.85	12.89
Row cultivate and side-dress fertilizer	2	1.24	.50	36.64	14.83
Spray insecticide	1	.37	.15	10.60	4.29
Picking (labour only)	[a]	523.85	212.00	2,750.22	1,113.00
Load in field	[a]	4.94	2.00	119.74	48.46
Haul to market[b]	[a]	2.47	1.00	59.87	24.23

[a] Operation performed as required.

[b] Hauling with tractor and wagons.

Table 35.--Green Peas for Processing: Estimated Cost of Production, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Seed, 252 kg/ha	245	99
Fertilizer, N - 37 kg/ha; P_2O_5 - 37 kg/ha; K_2O - 37 kg/ha	59	24
Herbicide	54	22
Tractor and machine costs:		
Repairs and maintenance	27	11
Fuel	22	9
Custom harvesting and hauling	400	162
Crop insurance	67	27
Marketing and grading fees	17	7
Interest on operating capital	10	4
TOTAL VARIABLE COSTS	**901**	**365**
FIXED COSTS		
Operator labour, 4 hours/ha	32	13
Management allowance, 5% of gross income	74	30
Tractor and machine costs:		
Depreciation	37	15
Interest on investment	25	10
Insurance and storage	7	3
Interest on land, $3,336/ha @ 6.8% per annum	227	92
Other overhead	37	15
TOTAL FIXED COSTS	**439**	**178**
TOTAL ALL COSTS	**1,340**	**543**
COST PER UNIT (Based on average yields of 3.59 tonnes/ha and 1.6 tons/acre)[a]	**373.26/tonne**	**339.38/ton**
GROSS MARGIN ANALYSIS (Based on average prices of $406.86/tonne and $369.20/ton)[b]		
Gross income	1,461	591
Total variable costs	901	365
Gross margin	560	226
CASH ANALYSIS		
Gross income	1,461	591
Cash costs[c]	949	385
Returns over cash costs	512	206

[a] Five-year average yields 1984-88.
[b] Based on 1989 contract price for a tenderometer reading of 111-112.
[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $11/ha ($5/acre) plus other overhead costs.

Table 36.--Green Peas for Processing: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Plowing	1	.99	.40	41.66	16.86
Discing	1	.35	.14	18.11	7.33
Spread fertilizer	1	.35	.14	9.07	3.67
Spray herbicides	2	.70	.28	19.82	8.02
Cultivate, harrow and pack	1	.35	.14	15.72	6.36
Haul seed	1	.25	.10	7.68	3.11
Planting	1	.99	.40	39.17	15.85
Custom harvesting and hauling	1	--	--	399.31	162.00

-- Not applicable.

Table 37.--Green and Wax Beans for Processing: Estimated Cost of Production, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Seed, 89 kg/ha	274	111
Fertilizer, N - 37 kg/ha; P_2O_5 - 37 kg/ha; K_2O - 37 kg/ha	59	24
Herbicide	79	32
Tractor and machine costs:		
Repairs and maintenance	25	10
Fuel	20	8
Custom harvesting and hauling	314	127
Custom spraying	15	6
Crop insurance	94	38
Marketing and grading fees	22	9
Interest on operating capital	10	4
TOTAL VARIABLE COSTS	**912**	**369**
FIXED COSTS		
Operator labour, 3.2 hours/ha	25	10
Management allowance, 5% of gross income	77	31
Tractor and machine costs:		
Depreciation	32	13
Interest on investment	22	9
Insurance and storage	7	3
Interest on land, $3,336/ha @ 6.8% per annum	227	92
Other overhead	37	15
TOTAL FIXED COSTS	**427**	**173**
TOTAL ALL COSTS	**1,339**	**542**
COST PER UNIT (Based on average yields of 6.05 tonnes/ha and 2.70 tons/acre)[a]	**221.32/tonne**	**200.74/ton**
GROSS MARGIN ANALYSIS (Based on average prices of $253.28/tonne and $229.84/ton)[b]		
Gross income	1,532	621
Total variable costs	912	369
Gross margin	620	252
CASH ANALYSIS		
Gross income	1,532	621
Cash costs[c]	959	388
Returns over cash costs	573	233

[a] Five-year average yields for 1984-88.
[b] 1989 contract price.
[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $10/ha ($4/acre) plus other overhead costs.

Table 38.--Green and Wax Beans for Processing: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Plowing	1	.99	.40	41.66	16.86
Discing	1	.35	.14	18.11	7.33
Spread fertilizer	1	.35	.14	9.07	3.67
Cultivate, harrow and pack	1	.35	.14	15.72	6.36
Haul seed	1	.25	.10	7.68	3.11
Planting	1	.49	.20	25.77	10.43
Custom spray herbicide	1	--	--	14.83	6.00
Row cultivate	1	.44	.18	12.11	4.90
Custom harvest and haul	1	--	--	313.57	126.90

-- Not applicable.

Table 39.--Lima Beans for Processing: Estimated Cost of Production, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Seed, 59 kg/ha	91	37
Fertilizer, N - 37 kg/ha; P_2O_5 - 37 kg/ha; K_2O - 37 kg/ha	59	24
Herbicide	54	22
Tractor and machine costs:		
Repairs and maintenance	30	12
Fuel	25	10
Custom harvesting and hauling	284	115
Crop insurance	94	38
Marketing fees	17	7
Interest on operating capital	30	12
TOTAL VARIABLE COSTS	**684**	**277**
FIXED COSTS		
Operator labour, 4.35 hours/ha	35	14
Management allowance, 5% of gross income	74	30
Tractor and machine costs:		
Depreciation	42	17
Interest on investment	30	12
Insurance and storage	10	4
Interest on land, $4,448/ha @ 6.8% per annum	301	122
Other overhead	37	15
TOTAL FIXED COSTS	**529**	**214**
TOTAL ALL COSTS	**1,213**	**491**
COST PER UNIT (Based on average yields of 2.51 tonnes/ha and 1.12 tons/acre)[a]	**483.27/tonne**	**438.39/ton**
GROSS MARGIN ANALYSIS (Based on average prices of $588.19/tonne and $533.75/ton)[b]		
Gross income	1,476	598
Total variable costs	684	277
Gross margin	792	321
CASH ANALYSIS		
Gross income	1,476	598
Cash costs[c]	734	297
Returns over cash costs	742	301

[a] Five-year average yields for 1984-88.
[b] 1989 contract price.
[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $13/ha ($5/acre) plus other overhead costs.

Table 40.--Lima Beans for Processing: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Plowing	1	.99	.40	41.66	16.86
Discing	1	.35	.14	18.11	7.33
Spread fertilizer	1	.35	.14	9.07	3.67
Spray herbicide	1	.35	.14	9.91	4.01
Cultivate, harrow and pack	2	.69	.28	31.48	12.74
Haul seed	1	.25	.10	7.68	3.11
Planting	1	.49	.20	25.77	10.43
Rotary hoeing	1	.35	.14	9.86	3.99
Row cultivate	1	.54	.22	14.80	5.99
Custom harvest and haul	1	--	--	285.05	115.36

-- Not applicable.

Table 41.--Peppers for Processing: Estimated Cost of Production, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 178 hours/ha	1,023	414
Plants, 27,181/ha	531	215
Fertilizer, N - 118 kg/ha; P_2O_5 - 168 kg/ha; K_2O - 168 kg/ha	245	99
Herbicide	15	6
Insecticides	173	70
Allowance for use of picking baskets	69	28
Tractor and machine costs:		
Repairs and maintenance	114	46
Fuel	111	45
Crop insurance	156	63
Marketing fees	49	20
Interest on operating capital	57	23
TOTAL VARIABLE COSTS	**2,543**	**1,029**
FIXED COSTS		
Operator labour, 27.8 hours/ha	222	90
Management allowance, 5% of gross income	220	89
Tractor and machine costs:		
Depreciation	188	76
Interest on investment	121	49
Insurance and storage	37	15
Interest on land, $4,448/ha @ 6.8% per annum	301	122
Other overhead	62	25
TOTAL FIXED COSTS	**1,151**	**466**
TOTAL ALL COSTS	**3,694**	**1,495**
COST PER UNIT (Based on average yields of 14.80 tonnes/ha and 6.60 tons/acre)[a]	**249.59/tonne**	**226.52/ton**
GROSS MARGIN ANALYSIS (Based on average prices of $295.85/tonne and $268.47/ton)[b]		
Gross income	4,379	1,772
Total variable costs	2,543	1,029
Gross margin	1,836	743
CASH ANALYSIS		
Gross income	4,379	1,772
Cash costs[c]	2,658	1,075
Returns over cash costs	1,721	697

[a] Five-year average yields for 1983-87.
[b] Price based on 1988 average price and 1989 negotiated increase.
[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $53/ha ($21/acre) plus other overhead costs.

Table 42.--Peppers for Processing: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Plowing	1	.99	.40	41.66	16.86
Discing	1	.37	.15	19.37	7.84
Spread fertilizer	1	.37	.15	9.71	3.93
Spray herbicide	1	.37	.15	10.60	4.29
Cultivate, harrow and pack	2	.74	.30	33.70	13.64
Haul plants	[a]	1.24	.50	38.55	15.60
Planting	1	29.65	12.00	402.68	162.96
Row cultivate	1	.62	.25	16.83	6.81
Spray insecticides	7	2.59	1.05	74.33	30.08
Hand hoeing (labour only)	1	17.30	7.00	99.46	40.25
Row cultivate and sidedress	1	.74	.30	21.94	8.88
Hand picking (labour only)	[a]	133.43	54.00	767.25	310.50
Load in field	[a]	14.82	6.00	222.24	89.94
Haul to market[b]	[a]	2.47	1.00	59.87	24.23

[a] Operation performed as required.

[b] Hauling to market by using a tractor and wagons.

Table 43.--Potatoes for Processing: Estimated Cost of Production, Ontario, 1989

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 31.8 hours/ha	272	110
Cover crop seed	15	6
Potato seed	642	260
Seed treatment	30	12
Fertilizer, N - 185 kg/ha; P_2O_5 - 185 kg/ha; K_2O - 185 kg/ha	289	117
Herbicide	99	40
Insecticides	114	46
Fungicides	131	53
Topkill	91	37
Tractor and machine costs:		
Repairs and maintenance	252	102
Fuel	166	67
Custom work	44	18
Marketing fees	54	22
Interest on operating capital	230	93
TOTAL VARIABLE COSTS	**2,429**	**983**
FIXED COSTS		
Operator labour, 8.4 hours/ha	62	25
Management allowance, 5% of gross income	156	63
Tractor and machine costs:		
Depreciation	188	76
Interest on investment	111	45
Insurance and storage	44	18
Interest on land, $3,707/ha @ 6.8% per annum	252	102
Other overhead	37	15
TOTAL FIXED COSTS	**850**	**344**
TOTAL ALL COSTS[a]	**3,279**	**1,327**
COST PER UNIT (Based on average yields of 21.5 tonnes/ha and 193 cwt./acre)[b]	**152.51/tonne**	**6.88/cwt.**
GROSS MARGIN ANALYSIS (Based on average prices of $143.96/tonne and $6.53/cwt)[c]		
Gross income	3,095	1,260
Total variable costs	2,429	983
Gross margin	666	277
CASH ANALYSIS		
Gross income	3,095	1,260
Cash costs[d]	2,518	1,019
Returns over cash costs	577	241

[a] This does not include storage costs.
[b] Four year's average yields for 1985-88.
[c] Price estimated based on three year's average return, 1986-88.
[d] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $52/ha ($21/acre) plus other overhead costs.

Table 44.--Potatoes for Processing: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Fall chisel plow	1	.49	.20	15.93	6.45
Fall disc	2	1.06	.43	38.10	15.42
Seed cover crop	1	.30	.12	12.03	4.87
Spring plowing (cover crop)	1	.82	.33	28.36	11.48
Spread lime (custom)	1	--	--	43.24	17.50
Spring disc	2	1.06	.43	38.10	15.42
Field cultivate	2	1.24	.50	43.66	17.67
Cut seed	1	.64	.26	19.45	7.87
Haul fertilizer and seed	1	1.24	.50	54.49	22.05
Plant	1	2.47	1.00	59.97	24.27
Row cultivate	1	.69	.28	20.51	8.30
Hill	1	.69	.28	22.38	9.06
Haul water for spraying	1	1.85	.75	42.58	17.23
Spray herbicide	2	.99	.40	41.86	16.94
Spray insecticide and fungicide	6	2.47	1.00	100.71	40.76
Spray topkill	1	.42	.17	17.12	6.93
Windrow[a]	1	3.95	1.60	153.25	62.02
Harvest with combine	1	5.93	2.40	116.66	47.21
Haul to storage	1	5.93	2.40	180.48	73.04
Unload at storage	1	7.91	3.20	91.97	37.22

[a] Two machines used.

Table 45.--Red Beets for Processing: Estimated Cost of Production, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 62 hours/ha	356	144
Seed, 7 kg/ha	62	25
Fertilizer, N - 123 kg/ha; P_2O_5 - 142 kg/ha; K_2O - 101 kg/ha	215	87
Herbicide	299	121
Micronutrient Sprays	21	9
Tractor and machine costs:		
Repairs and maintenance	49	20
Fuel	44	18
Custom harvesting and hauling	534	216
Crop insurance	30	12
Marketing fees	32	13
Interest on operating capital	57	23
TOTAL VARIABLE COSTS	**1,699**	**688**
FIXED COSTS		
Operator labour, 13 hours/ha	104	42
Management allowance, 5% of gross income	151	61
Tractor and machine costs:		
Depreciation	82	33
Interest on investment	54	22
Insurance and storage	17	7
Interest on land, $6,672/ha @ 6.8% per annum	455	184
Other overhead	37	15
TOTAL FIXED COSTS	**900**	**364**
TOTAL ALL COSTS	**2,599**	**1,052**
COST PER UNIT (Based on average yields of 31.84 tonnes/ha and 14.2 tons/acre)[a]	**81.63/tonne**	**74.08/ton**
GROSS MARGIN ANALYSIS (Based on average prices of $95.27/tonne and $86.45/ton)[b]		
Gross income	3,033	1,228
Total variable costs	1,699	688
Gross margin	1,334	540
CASH ANALYSIS		
Gross income	3,033	1,228
Cash costs[c]	1,760	713
Returns over cash costs	1,273	515

[a] Five-year average yields for 1984-88.
[b] 1989 price based on 1988 actual price, plus negotiated price increase.
[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $24/ha ($10/acre) plus other overhead costs.

Table 46.--Red Beets for Processing: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Plowing	1	.79	.32	33.36	13.50
Discing	1	.40	.16	20.71	8.38
Spread fertilizer	1	.40	.16	10.35	4.19
Spray herbicide	2	.80	.32	22.64	9.16
Cultivate and harrow	1	.40	.16	16.58	6.71
Planting	1	1.98	.80	66.27	26.82
Row cultivate	3	3.56	1.44	96.79	39.17
Sidedress	1	1.38	.56	41.02	16.60
Hand hoeing (labour only)	1	61.77	25.00	355.21	143.75
Spray foliar micronutrients	2	.79	.32	22.66	9.17
Custom harvest	1	--	--	266.63	107.90
Custom haul	1	--	--	266.63	107.90
Help harvest (labour only)	[a]	2.47	1.00	19.77	8.00

[a] Operation performed as required.

-- Not applicable.

Table 47.--Sweet Corn for Processing: Estimated Cost of Production, Ontario, 1989

	Cost per hectare	Cost per acre
	- dollars -	
VARIABLE COSTS		
Seed, 9 kg/ha	52	21
Fertilizer, N -111 kg/ha; P_2O_5 - 68 kg/ha; K_2O - 68 kg/ha	138	56
Herbicide	54	22
Insecticide	17	7
Tractor and machine costs:		
Repairs and maintenance	27	11
Fuel	22	9
Custom spray and apply "N"	32	13
Custom harvest and haul	156	63
Crop insurance	37	15
Marketing fees	12	5
Interest on operating capital	7	3
TOTAL VARIABLE COSTS	**554**	**225**
FIXED COSTS		
Operator labour, 3.6 hours/ha	30	12
Management allowance, 5% of gross income	52	21
Tractor and machine costs:		
Depreciation	37	15
Interest on investment	27	11
Insurance and storage	7	3
Interest on land, $3,336/ha @ 6.8% per annum	227	92
Other overhead	37	15
TOTAL FIXED COSTS	**417**	**169**
TOTAL ALL COSTS	**971**	**394**
COST PER UNIT (Based on average yields of 11.44 tonnes/ha and 5.1 tons/acre)[a]	**84.88/tonne**	**77.26/ton**
GROSS MARGIN ANALYSIS (Based on average prices of $91.80/tonne and $83.30/ton)[b]		
Gross income	1,050	425
Total variable costs	554	225
Gross margin	496	200
CASH ANALYSIS		
Gross income	1,050	425
Cash costs[c]	602	245
Returns over cash costs	448	180

[a] Five-year average yields for 1984-88.

[b] 1989 contract price used at 70% domestic and 30% export.

[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $11/ha ($5/acre) plus other overhead costs.

Table 48.--Sweet Corn for Processing: Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Plowing	1	.99	.40	41.66	16.86
Discing	1	.34	.14	18.11	7.33
Cultivate, harrow and pack	1	.35	.14	15.72	6.36
Haul seed	1	.25	.10	7.68	3.11
Planting	1	.49	.20	25.77	10.43
Spray herbicide	1	.35	.14	9.91	4.01
Row cultivate	1	.44	.18	12.11	4.90
Custom apply "N" and herbicide	1	--	--	13.59	5.50
Custom spray insecticide	1	--	--	16.06	6.50
Custom harvest and haul	1	--	--	155.62	62.98
Disc stalks	1	.34	.14	18.11	7.33

-- Not applicable.

Table 49.--Tomatoes for Processing, (Hand Harvest), Estimated Cost of Production, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 340 hours/ha	2,044	827
Plants, 22,486/ha	479	194
Fertilizer: plant starter, 25 litres/hectare	12	5
N - 113 kg/ha; P_2O_5 - 94 kg/ha; K_2O - 269 kg/ha	233	94
Herbicide	62	25
Insecticides and fungicides (custom applied, materials included)	390	158
Basket use for picking, 247/ha	138	56
Other materials	22	9
Tractor and machine costs:		
Repairs and maintenance	94	38
Fuel	96	39
Custom hauling	368	149
Crop insurance	84	34
Marketing board and grading fees	89	36
Interest on operating capital	96	39
TOTAL VARIABLE COSTS	**4,207**	**1,703**
FIXED COSTS		
Operator labour, 18 hours/ha	148	60
Management allowance, 5% of gross income	292	118
Tractor and machine costs:		
Depreciation	156	63
Interest on investment	99	40
Insurance and storage	32	13
Land rental charges	457	185
Other overhead	37	15
TOTAL FIXED COSTS	**1,221**	**494**
TOTAL ALL COSTS	**5,428**	**2,197**
COST PER UNIT (Based on average yields of 43.5 tonnes/ha and 19.4 tons/acre)[a]	**124.78/tonne**	**113.25/ton**
GROSS MARGIN ANALYSIS (Based on average prices of $134.34/tonne and $121.91/ton)[b]		
Gross income	5,844	2,365
Total variable costs	4,207	1,703
Gross margin	1,637	662
CASH ANALYSIS		
Gross income	5,844	2,365
Cash costs[c]	4,288	1,736
Returns over cash costs	1,556	629

[a] Five-year average yields for 1984-88.

[b] Using option A, agtron reading of 0-30, and the 1989 price schedule.

[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $44/ha ($18/acre) plus other overhead costs.

Table 50.--Tomatoes for Processing, (Hand Harvest): Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Plowing	1	.74	.30	31.23	12.64
Discing	1	.37	.15	19.37	7.84
Spread fertilizer	1	.37	.15	9.71	3.93
Field cultivate and harrow	1	.37	.15	15.49	6.27
Spray herbicide	1	.37	.15	10.60	4.29
Incorporate spray	1	.37	.15	15.02	6.08
Haul water and plants	[a]	1.73	.70	49.20	19.91
Planting	1	27.18	11.00	267.58	108.29
Row cultivate	2	.99	.40	23.33	9.44
Row cultivate and sidedress	1	.62	.25	16.09	6.51
Hand hoeing (labour only)	1	17.30	7.00	99.46	40.25
Apply ethrel	[b]	.25	.10	7.07	2.86
Hand picking (labour only)	[a]	279.2	113.0	1,675.34	678.00
Spread baskets	[a]	5.93	2.40	71.54	28.95
Load in field	[a]	22.24	9.00	356.05	144.09
Haul to processor (custom)	[a]	--	--	368.68	149.20

[a] Operation performed as required.

[b] Applied on 20% of the acreage.

-- Not applicable.

Table 51.--Tomatoes for Processing, (Machine Harvest): Estimated Cost of Production, Ontario, 1989

	Cost	
	per hectare	per acre
	- dollars -	
VARIABLE COSTS		
Hired labour, 73.4 hours/ha	437	177
Plants, 30,888/ha	692	280
Fertilizer: plant starter, 24.7 litres/ha	12	5
N - 90 kg/ha; P_2O_5 - 94 kg/ha; K_2O - 269 kg/ha	218	88
Herbicide	62	25
Insecticides and fungicides	193	78
Other materials	74	30
Tractor and machine costs:		
Repairs and maintenance	297	120
Fuel	146	59
Crop insurance	91	37
Marketing board and grading fees	89	36
Interest on operating capital	77	31
TOTAL VARIABLE COSTS	**2,388**	**966**
FIXED COSTS		
Operator labour, 19.4 hours/ha	156	63
Management allowance, 5% of gross income	287	116
Tractor and machine costs:		
Depreciation	1,109	449
Interest on investment	541	219
Insurance and storage	124	50
Land rental charges	741	300
Other overhead	37	15
TOTAL FIXED COSTS	**2,995**	**1,212**
TOTAL ALL COSTS	**5,383**	**2,178**
COST PER UNIT (Based on average yields of 43.5 tonnes/ha and 19.4 tons/acre)[a]	**123.75/tonne**	**112.27/ton**
GROSS MARGIN ANALYSIS (Based on average prices of $131.61/tonne and $119.43/ton)[b]		
Gross income	5,725	2,317
Total variable costs	2,388	966
Gross margin	3,337	1,351
CASH ANALYSIS		
Gross income	5,725	2,317
Cash costs[c]	2,662	1,077
Returns over cash costs	3,063	1,240

[a] Five-year average yields for 1984-88.
[b] Using option B, agtron reading of 0-30, and the 1989 price schedule.
[c] Cash costs include total variable costs, plus interest on debt portion of investment in tractors and machines of $237/ha ($96/acre) plus other overhead costs.

Table 52.--Tomatoes for Processing, (Machine Harvest): Operation Costs, Ontario, 1989

Operation	Times over	Labour		Labour, tractor and machine costs	
		per ha.	per ac.	per ha.	per ac.
		- hours -		- dollars -	
Plowing	1	.62	.25	26.04	10.54
Spread fertilizer	1	.49	.20	12.48	5.05
Shape beds (fall)	1	.62	.25	36.74	14.87
Reshape beds (spring)	1	.62	.25	36.74	14.87
Incorporate herbicide (using shaper)	1	.62	.25	36.74	14.87
Haul water and plants	[a]	.84	.34	18.16	7.35
Planting	1	27.09	10.96	234.50	94.90
Control weeds (using shaper)	2	.99	.40	58.81	23.80
Control weeds and sidedress (using shaper)	2	1.24	.50	73.51	29.75
Hand hoe (labour only)	1	17.30	7.00	99.46	40.25
Spray fungicides	6	2.22	.90	106.30	43.02
Spray insecticides	2	.74	.30	35.43	14.34
Haul water for spraying	[a]	.44	.18	15.94	6.45
Apply ethrel	[b]	.49	.20	24.12	9.76
Harvest	1	23.23	9.40	1,300.37	526.25
Haul from harvester	1	8.30	3.36	270.25	109.37
Deliver to processor	[a]	6.92	2.80	424.00	171.59

[a] Operation performed as required.

[b] Applied on 75% of the acreage.

Appendix Table 1.--Average Yields per Acre for Vegetables, Ontario, 1984-1988

Crop	Unit	1984	1985	1986	1987	1988	Avg. 5 Yr.
				- '000 -			
Asparagus (f & p)	lb	1.1	1.2	1.4	1.2	1.5	1.3
Beans, green & wax (f)	lb	5.7	4.9	3.9	3.8	3.7	4.4
Beans, green & wax (p)	lb	5.7	5.6	5.1	5.3	5.0	5.4
Beans, Lima (p)	lb	2.7	2.0	2.3	2.0	2.2	2.2
Beets, topped	lb	28.7	28.7	26.0	28.7	29.6	28.3
Beets, bunching	lb	12.9	14.6	6.1	10.7	11.3	11.1
Broccoli (f & p)	lb	9.1	7.6	7.2	7.4	5.5	7.4
Brussels Sprouts	lb	10.1	9.3	4.2	4.3	4.4	6.5
Cabbage	lb	34.5	34.5	25.0	27.8	20.9	28.5
Carrots, bunching	lb	10.2	9.7	8.2	10.9	8.8	9.6
Carrots, topped (f & p)	lb	65.1	51.7	43.3	49.6	49.9	51.9
Cauliflower (f & p)	lb	21.3	16.3	20.1	18.9	9.1	17.1
Celery (f & p)	lb	70.3	56.0	53.1	64.3	79.4	64.6
Corn, sweet (f)	dz	0.9	0.9	0.8	0.8	0.7	0.8
Corn, sweet (p)	lb	10.6	10.2	10.4	11.4	8.5	10.2
Cucumber (f)	lb	15.7	11.9	10.5	9.5	11.7	11.9
Cucumber (p)	lb	18.3	18.4	19.5	17.4	17.2	18.2
Lettuce, head (f)	dz	1.2	1.3	1.2	1.3	0.8	1.2
Onions, dry sets	lb	18.6	21.2	18.2	20.9	11.9	18.2
Onions, dry silverskin	lb	10.1	11.5	7.0	10.3	8.7	9.5
Onions, dry spanish	lb	23.1	18.4	26.9	25.9	12.1	21.3
Onions, dry yellowskin	lb	31.6	43.6	36.1	37.6	36.8	37.1
Onions, bunching	lb	16.2	17.0	13.0	13.4	12.9	14.5
Parsnips	lb	17.6	16.6	17.5	17.3	11.3	16.1
Peas, green (p)	lb	3.4	4.1	3.4	3.1	2.2	3.2
Peppers (f & p)	lb	10.8	10.7	9.5	11.2	8.9	10.2
Potatoes	lb	19.1	20.5	20.4	18.7	14.4	18.6
Pumpkin & Squash	lb	27.0	20.3	27.9	27.1	22.7	25.0
Radishes	lb	9.3	10.1	11.5	10.2	7.9	9.8
Rutabagas	lb	36.0	28.8	32.5	30.4	23.8	30.3
Spinach	lb	8.0	9.0	5.5	8.0	6.9	7.5
Tomatoes (f)	lb	20.2	21.2	27.7	18.9	19.6	21.5
Tomatoes (p)	lb	39.3	39.1	39.1	40.1	36.2	38.8

Note: (f) fresh; (f & p) fresh & processing; (p) processing;
n/a not available

Source: Seasonal Fruit and Vegetable Report, Annual Summary, Economics and Policy Coordination Branch, Ontario Ministry of Agriculture and Food.

Appendix Table 2.--Average Prices per Unit for Vegetables, Ontario, 1984-1988

Crop	Unit	1984	1985	1986	1987	1988	Avg. 5 Yr.
				- cents -			
Asparagus (f & p)	lb	101.0	99.3	96.0	94.4	98.7	97.9
Beans, green & wax (f)	lb	28.0	26.9	38.4	34.4	46.1	34.8
Beans, green & wax (p)	lb	11.6	11.7	10.9	10.9	11.2	11.3
Beans, Lima (p)	lb	24.3	24.6	24.4	24.4	25.1	24.6
Beets, topped	lb	5.4	3.8	5.8	5.3	8.9	5.8
Beets, bunching	lb	41.0	31.3	33.7	44.3	59.1	41.9
Broccoli (f & p)	lb	34.6	34.7	38.1	34.3	41.6	36.7
Brussels Sprouts	lb	44.3	35.0	41.6	59.2	47.2	45.5
Cabbage (f & p)	lb	5.5	7.3	11.6	11.4	12.4	9.6
Carrots, bunching	lb	3.1	27.2	24.4	29.5	33.9	23.6
Carrots, topped (f & p)	lb	16.3	4.8	7.0	4.7	4.3	7.4
Cauliflower (f & p)	lb	15.3	20.8	19.8	21.0	26.3	20.6
Celery (f & p)	lb	8.2	10.2	10.4	8.6	10.2	9.5
Corn, sweet (f)	dz	105.0	121.0	128.0	128.2	168.6	130.2
Corn, sweet (p)	lb	3.6	3.6	3.3	3.8	3.5	3.6
Cucumber (f)	lb	11.0	17.5	17.5	21.4	20.1	17.5
Cucumber (p)	lb	10.5	10.4	10.2	9.4	10.0	10.1
Cucumber, greenhouse	dz	630.9	524.5	535.6	449.0	554.0	538.8
Lettuce (f)	dz	331.0	291.0	321.0	330.4	289.8	312.6
Onions, dry sets	lb	10.9	10.1	15.9	12.4	23.7	14.6
Onions, dry, silverskin	lb	41.0	42.0	35.1	33.5	56.8	41.7
Onions, dry, spanish	lb	15.2	13.2	14.6	14.4	16.7	14.8
Onions, dry, yellowskin	lb	4.4	4.0	11.6	11.3	9.5	8.2
Onions, bunching	lb	34.8	39.8	41.7	49.8	52.3	43.7
Parsnips	lb	16.0	16.0	15.2	16.2	20.6	16.8
Peas, green (p)	lb	16.1	17.0	16.5	16.5	16.0	16.4
Peppers (f & p)	lb	15.1	20.5	21.9	18.9	23.7	20.0
Potatoes	lb	6.8	1.7	9.0	6.7	7.8	6.4
Pumpkin & Squash	lb	1.7	1.8	1.8	1.8	2.0	1.8
Radishes	lb	33.7	33.8	26.9	31.5	36.3	32.4
Rutabagas	lb	3.9	5.5	4.9	7.4	8.3	6.0
Spinach	lb	29.0	20.3	31.2	30.1	31.9	28.5
Tomatoes (f)	lb	20.2	19.2	27.0	21.7	21.8	22.0
Tomatoes, greenhouse	lb	80.1	59.2	75.8	61.5	55.5	66.4
Tomatoes (p)	lb	5.6	5.6	5.6	5.2	5.6	5.5

Note: (f) fresh; (f & p) fresh & processing; (p) processing;
n/a not available

Source: Seasonal Fruit and Vegetable Report, Annual Summary, Economics and Policy Coordination Branch, Ontario Ministry of Agriculture and Food.

Appendix Table 3.--Average Yields per Hectare for Vegetables, Ontario, 1984-1988

Crop	1984	1985	1986	1987	1988	Avg. 5 Yr.
			- tonnes -			
Asparagus (f & p)	1.2	1.3	1.6	1.4	1.7	1.4
Beans, green & wax (f)	6.4	5.5	4.4	4.3	4.1	4.9
Beans, green & wax (p)	6.4	6.3	5.7	6.7	5.6	6.1
Beans, lima (p)	3.0	1.8	1.1	2.3	2.5	2.1
Beets, topped	32.2	32.1	29.1	32.2	33.2	31.8
Beets, bunching	14.5	16.4	6.8	12.0	12.7	12.5
Broccoli (f & p)	10.2	8.5	8.0	8.3	6.1	8.2
Brussels Sprouts	11.3	10.5	4.7	4.8	4.9	7.2
Cabbage (f & p)	38.7	38.7	28.6	31.2	23.5	32.1
Carrots, bunching	11.4	11.0	9.2	12.2	9.8	10.7
Carrots, topped (f & p)	73.0	58.1	48.7	55.6	55.9	58.3
Cauliflower (f & p)	23.9	18.3	22.5	21.2	10.2	19.2
Celery (f & p)	78.8	62.8	59.6	72.1	89.0	72.5
Corn, sweet (f)	6.1	5.8	5.1	5.3	4.7	5.4
Corn, sweet (p)	11.9	11.4	11.7	12.8	9.6	11.5
Cucumber (f)	17.6	13.3	11.8	10.6	13.1	13.3
Cucumber (p)	20.5	20.7	21.9	19.5	19.3	20.4
Lettuce, (f)	20.2	22.0	20.2	21.8	14.2	19.7
Onions, dry sets	20.9	23.8	20.4	23.4	13.3	20.4
Onions, dry silverskin	11.3	12.8	7.8	11.5	9.8	10.6
Onions, dry spanish	25.9	20.6	30.1	29.0	13.6	23.8
Onions, dry yellowskin	35.4	48.9	40.5	42.1	41.2	41.6
Onions, bunching	18.2	19.1	14.6	15.0	14.4	16.3
Parsnips	19.7	18.6	19.6	19.4	12.7	18.0
Peas, green (p)	3.8	4.6	3.8	3.4	2.4	3.6
Peppers (f & p)	12.1	12.5	10.6	12.6	10.0	11.6
Potatoes	21.4	22.9	21.7	21.0	16.1	20.6
Pumpkin & Squash	30.3	22.8	31.3	30.3	25.4	28.0
Radishes	10.4	11.3	12.9	11.5	8.9	11.0
Rutabagas	31.2	32.3	36.5	34.1	26.7	32.2
Spinach	9.0	10.1	6.2	9.0	7.7	8.4
Tomatoes (f)	22.6	23.7	31.0	21.1	21.9	24.1
Tomatoes (p)	44.1	43.8	43.8	44.9	40.6	43.4

Note: (f) fresh; (f & p) fresh & processing; (p) processing;
n/a not available

Source: Seasonal Fruit and Vegetable Report, Annual Summary, Economics and Policy Coordination Branch, Ontario Ministry of Agriculture and Food.

Appendix Table 4.--Average Prices per Kilogram for Vegetables, Ontario 1984-1988

Crop	1984	1985	1986	1987	1988	Avg. 5 Yr.
			- cents -			
Asparagus (f & p)	223.5	219.3	211.9	208.1	217.6	216.1
Beans, green & wax (f)	61.7	59.2	84.7	75.8	101.7	76.6
Beans, green & wax (p)	25.6	25.8	24.0	22.1	24.6	24.4
Beans, lima (p)	53.6	54.2	53.7	53.7	55.2	54.1
Beets, topped	11.9	8.5	12.8	11.6	19.6	12.9
Beets, bunching	90.4	69.0	74.3	97.6	130.4	92.3
Broccoli (f & p)	76.3	76.6	84.1	75.6	91.6	80.8
Brussels Sprouts	97.7	77.2	91.7	130.5	104.1	100.2
Cabbage (f & p)	12.1	16.2	25.6	25.2	27.4	21.3
Carrots, topped (f & p)	35.9	10.5	15.4	10.4	9.5	16.3
Carrots, bunching	6.8	60.0	53.8	65.0	74.7	52.1
Cauliflower (f & p)	33.7	45.9	43.7	46.3	58.0	45.5
Celery (f & p)	18.1	22.4	22.9	19.0	22.5	21.0
Corn, sweet (f)	38.6	44.4	47.1	47.1	62.0	47.8
Corn, sweet (p)	7.9	8.0	7.3	8.4	7.8	7.9
Cucumber (f)	24.3	38.7	38.6	47.2	44.2	38.6
Cucumber (p)	23.2	23.0	22.4	20.7	22.1	22.3
Cucumber, greenhouse	173.9	144.5	147.6	123.7	152.7	148.5
Lettuce (f)	48.7	42.8	47.2	48.6	42.6	46.0
Onions, bunching	76.7	87.7	91.9	109.7	115.2	96.2
Onions, dry sets	24.0	22.3	35.1	27.3	52.2	32.2
Onions, dry silverskin	90.4	92.6	77.4	73.9	125.3	91.9
Onions, dry spanish	33.5	29.1	32.2	31.7	36.7	32.6
Onions, dry yellowskin	9.7	8.8	25.6	24.9	20.9	18.0
Parsnips	35.3	35.2	33.5	35.8	45.4	37.0
Peas, green (p)	33.3	37.4	36.3	36.4	35.3	35.7
Peppers (f & p)	33.3	45.2	48.3	41.6	52.2	44.1
Potatoes	15.0	11.6	19.8	14.8	17.1	15.7
Pumpkin & Squash	3.8	4.0	4.0	4.1	4.4	4.1
Radishes	74.3	74.5	59.3	69.4	80.0	71.5
Rutabagas	8.6	12.2	10.8	16.4	18.3	13.3
Spinach	63.9	44.6	68.8	66.3	70.3	62.8
Tomatoes (f)	44.5	42.4	59.5	47.9	48.1	48.5
Tomatoes, greenhouse	176.6	130.4	167.1	135.6	122.4	146.4
Tomatoes (p)	12.4	12.4	12.3	11.4	12.4	12.2

Note: (f) fresh; (f & p) fresh & processing; (p) processing;
n/a not available

Source: Seasonal Fruit and Vegetable Report, Annual Summary, Economics and Policy Coordination Branch, Ontario Ministry of Agriculture and Food.

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